123EMED-100

Method and System for Promotion of Non-Invasive and Less Invasive Medical Procedures on the Internet and by Other Means

Field of the Invention

This invention relates to a system and method for facilitating the utilization of specialized medical equipment. More particularly, this invention relates to a system for promoting the distribution of medical equipment utilized in minimally invasive medical procedures.

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Background of the Invention

U.S. Food and Drug Administration (FDA) approved, minimally invasive or non-invasive medical and surgical procedures offering substantial benefits over conventional methods still face significant market resistance. Surprisingly, the utilization of non-invasive and less invasive medical procedures can be especially constrained by market pressures.

In the United States and many other countries, physicians' fees paid by Medicare and other third-party payers are based on the time, skill and "intensity" (i.e. risk) of a medical or surgical procedure. As a result, physicians are traditionally paid less for performing non-invasive or less invasive procedures than they would receive for performing conventional medical or surgical procedures that require significant skill and time, entail a greater risk to the patient, are significantly

more costly and require extensive hospital bed stays and recuperation time. Physicians may not take time away from their practices to learn, or recommend to their patients, less invasive, lower cost procedures, for which

5 they are paid a smaller amount.

For example, an estimated ten million people in the United States suffer from lower back pain, often due to a herniated (bulging) or ruptured lumbar disc. The conventional therapy for a herniated or ruptured lumbar

10 disc is a two hour or longer surgical "discectomy" procedure, which requires general anesthesia and entails a two-to-five day hospital stay, considerable pain for several weeks and a two-to-three month recovery period. In the United States, an orthopedic surgeon is paid

15 approximately $5,000 for performing this procedure.

A less invasive procedure, called endoscopic laser foraminoplasty, to treat herniated or ruptured lumbar discs, is now available in the United States and other countries. The laser and fiber optic needles used

20 to perform this procedure have been cleared for commercial sale in the United States by the FDA. Laser foraminoplasty is a 20 to 30 minute outpatient procedure, performed through an endoscope, which is inserted through a tiny, 1/4 inch puncture in the back under local

25 anesthesia. The patient is usually in and out of the hospital in less than two hours with a Band Aid® (Johnson & Johnson, New Brunswick, NJ) over the puncture (no stitches), and is able to return to normal activities in a few days. In the United States, an orthopedic surgeon

30 is paid approximately $2,800 for performing the laser foraminoplasty procedure, compared to $5,000 for the discectomy surgical procedure.

Published studies show the success rate of the laser foraminoplasty procedure over a period of four

35 years to be 85 to 90 percent, comparable to the success

rate of the surgical discectomy procedure, with far fewer adverse effects. If the patient does not know about the laser foraminoplasty procedure and does not ask for, or insist upon the laser foraminoplasty procedure, he is

5 likely to undergo the surgical discectomy procedure.

Alternate medical treatments for angina offer another example. According to a 1998 publication of the American Heart Association, approximately seven million people in the United States suffer from chronic, stable

10 angina (severe chest pain on exertion due to blockages in one or more of their coronary arteries). An estimated 600,000 balloon angioplasties with stents at an average cost of $20,000 (with a 20 percent or greater failure rate), and approximately 450,000 coronary bypass

15 surgeries at an average cost of $40,000 (with a three to eight percent mortality rate, a significant hospital stay and a two to three month recovery period) are performed each year in the United States to treat this condition.

According to published studies, however,

20 approximately 78 percent of chronic, stable angina patients could be successfully treated with a new, outpatient, non-invasive External CounterPulsation (ECP) device that can dramatically increase the circulatory capacity of their hearts by stimulating the growth of new

25 blood vessels in the heart muscle. A recently published study showed the five year survival rate of chronic, stable angina patients after receiving ECP therapy was comparable to the five-year survival rate of chronic, stable angina patients after receiving balloon

30 angioplasty or bypass surgery, based on published studies on these procedures.

No anesthesia is used in the ECP procedure, not even a local anesthetic. The ECP device used in this break-through therapy, which has been cleared for

35 commercial sale in the United States by the FDA, enables

the patient to avoid an expensive and risky surgical procedure. The cost to the patient's health plan, insurance company or Medicare is approximately $5,000, which is paid to the hospital or outpatient facility,

5   significantly less than the $40,000 cost of bypass surgery or the $20,000 cost of balloon angioplasty with stents, which are used in approximately 80% of balloon angioplasty procedures.

          Traditionally, to treat severe, stable angina,

10   cardiologists perform an angiogram, balloon angioplasty and the implantation of one or more stents in the blocked arteries. These procedures usually require two to three hours of time in an expensive cardiac catheterization facility, entail considerable skill and represent a

15   significant risk to the patient. Cardiologists are paid about $1,500 for performing these procedures on an angina patient in the United States. Hospitals receive the rest of the $20,000 angioplasty/stent cost to third-party players.

20   If the balloon angioplasty fails, the patient proceeds to coronary bypass surgery, which takes three to four hours and entails significant skill and much greater risk of death or adverse effects. The surgeon's fee for performing bypass surgery in the U.S. is about $2,400,

25   and the hospital receives the balance of the $40,000 fee.

         In the United States, Medicare pays a cardiologist $330 for treating a severe angina patient with the outpatient, non-invasive ECP therapy. The physician typically devotes 30 minutes of his time to

30   setting the controls, evaluating the patient's response to ECP therapy, writing the order and reviewing the results after a total of 35 hours of outpatient ECP therapy. A nurse or technician actually treats the patient with the ECP System, one hour per day, five or

35   six days a week over a period of six to seven weeks.

With the fee for ECP being only $330, compared to about $1,500 for an angiogram, balloon angioplasty and stents, physicians may not take time away from their practices to learn the new therapy, ask their hospital to buy the

5   equipment or recommend it to their patients. Unless an angina patient knows about ECP therapy and asks for or insists upon ECP therapy, he'll likely get an angiogram, balloon angioplasty, stents and, possibly, coronary bypass surgery, if the angioplasty procedure fails.

10   There are many other conditions which can be treated less invasively, but physicians may not recommend these procedures to their patients or take time away from their practices to learn how to perform procedures for which they are paid a lower fee. Also, if physicians do

15   not insist that their hospital, outpatient surgery center, clinic or group practice buy the equipment to perform a new procedure, which can cost $100,000 to $400,000, depending on the instruments required, the equipment is usually not purchased.

20   A variety of other minimally invasive, device dependent procedures suffer the same problems, such as a laser-based procedure to treat enlarged prostates in men, a radio-frequency device to treat gastro-esophageal reflux disease and a cryotherapy-based procedure to treat

25   prostate cancer. All of the above minimally invasive procedures avoid a more invasive surgery, but the physicians's fee is substantially less than for the surgical procedure.

         Manufacturers of the equipment and related

30   disposables used in non- and less invasive procedures often do not have the financial resources to advertise the availability of these new procedures nationally. Furthermore, they do not have the means to refer prospective patients to physicians for these therapies,

35   and they do not know what insurance coverages and health

plans the physicians will accept. It would be labor intensive and prohibitively expensive for a manufacturer of the medical equipment and disposables used in one, or even several less invasive procedures to enroll

5 hospitals, surgery centers, clinics and physicians as "providers" of the new procedures on a national basis, equip the "providers" with the instruments and disposables needed to perform the new procedures, train the physicians and their staffs to perform the new

10 procedures, collect personal information on the physicians who will perform the new procedures, including what insurance and health plans they will accept, mount a national advertising program to attract persons suffering from a condition that can be treated with one of the new

15 procedures, explain the new procedure and its risks and benefits to persons with such conditions who respond to the advertising program, and arrange appointments for those who want to undergo one of the new procedures with physicians at hospitals or clinics in their vicinity who

20 will accept their insurance or health plan.

Thus, there remains a need for a cost-effective and systematic approach to increasing the demand for and utilization of non-invasive and less invasive medical procedures.

25 Summary of the Invention

Therefore, a computerized method according to the present method facilitates the utilization of a device-dependent medical or surgical procedure for a medical condition and promotes the distribution of the

30 related specialized medical equipment and utilization of disposable devices used therewith. Distribution of the medical equipment is promoted by providing a computer message server that includes a stored, predefined message pertaining to the device-dependent medical procedure and

35 a stored provider directory containing contact

information for a plurality of medical service providers
qualified to perform the device-dependent medical
procedure, including what insurance coverages the medical
providers will accept.

A user interface linkage is provided to the
computer message server over a wide access communication
network for exchanging data with a user, such as a
patient interested in a non or less invasive treatment
for the specific medical condition, along with
information on its risks and benefits, compared to the
traditional surgical procedures for treating the
condition. An access route to the user interface linkage
is advertised publicly, together with an advertised
message about the availability of a less invasive or non-
invasive procedure to treat the medical condition. The
computerized system receives from the user, via the user
interface linkage, a user location identifier. The
provider directory is queried with the received user
location identifier to obtain a result, including contact
information for at least one of a plurality of procedure-
qualified medical service providers in the vicinity of
the user. This result is then communicated to the user.

In a preferred embodiment, the result is a
message which includes a list of multiple procedure-
qualified medical service providers listed in order,
according to proximity to the user based on the user
location identifier. The result also preferably includes
a disclaimer of liability and a warning message to see a
qualified physician for advice specific to his or her
medical condition.

In an alternate preferred embodiment, the
result is a message which includes a list of multiple
procedure-qualified medical service providers listed in
order, according to either the provider's proximity to
the user based on the user location identifier, or

according to whether the provider has paid a monthly fee for a preferred listing position. The result also preferably includes a description of the medical procedure, information on its clinical benefits and a warning message describing the risks associated therewith.

The wide access communication network is preferably a computer network such as the Internet, a telephone network, or a combination of these.

In an alternate preferred embodiment, the computerized system receives from the user both a user location identifier and the user's insurance plan. The insurance plan data is used to selectively display only qualified providers that accept the user's insurance. If none of the medical service providers will accept the user's insurance plan, information may be provided on the medical service providers who perform such procedures on a fee-for-service basis and the insurance coverages and health plans they do accept.

A preferred computer system also allows the user to contact a health plan a preferred provider will accept to enroll therein.

Brief Description of the Drawings

In the accompanying drawings that form part of the specification,

FIGURE 1 is a schematic block diagram illustrating the software modules and computer hardware of an Internet-connected system for the promotion of less invasive medical or surgical procedures or other predetermined types of procedures; FIGURE 2 is a simplified flowchart of a preferred Internet-based embodiment of method steps according to the present invention for promotion of predetermined medical or surgical procedures;

FIGURE 3 is a schematic block diagram illustrating the software modules, computer hardware and connections of a telephone interactive messaging system for the promotion of a non-invasive medical or surgical

5 procedure for the treatment of angina in accordance with an alternate embodiment of the present invention;

FIGURE 4 is a simplified flowchart of a preferred telephone-based embodiment of method steps according to the present invention for promotion of a

10 non-invasive medical procedure for the treatment of angina;

FIGURE 5 is an exemplary advertisement message directing prospective users to an Internet World Wide Web site (e.g. 123emed.com) and a toll-free phone message

15 service for information about therapies for angina in accordance with an embodiment of the present invention;

FIGURE 6 is an exemplary advertisement message directing prospective users to an Internet World Wide Web site and a toll-free phone message service for

20 information about therapies for a herniated or ruptured lumbar disc in accordance with an embodiment of the present invention;

FIGURE 7 is an introductory Internet World Wide Web site display allowing users accessing a website (e.g.

25 123emed.com) to select from a menu of medical conditions in accordance with an embodiment of the present invention; and

FIGURE 8 is a flowchart representing the commercial application of an embodiment of the present

30 invention.

In the FIGURES, a single block or cell may indicate several individual software and/or hardware components that collectively perform the identified single function. Likewise, a single line may represent

several individual signals or several instances of
software data sharing or interconnection.

Description of the Preferred Embodiments

The invention disclosed herein is, of course,
5   susceptible of embodiment in many different forms. Shown
in the drawings and described herein below in detail are
preferred embodiments of the invention. It is to be
understood, however, that the present disclosure is an
exemplification of the principles of the invention and
10   does not limit the invention to the illustrated
embodiments.

The present invention provides a system and
method for promoting and facilitating the utilization of
device-dependent medical treatments or surgical
15   procedures for a medical condition by attracting and
efficiently referring targeted consumers to medical
service providers owning the necessary equipment and
qualified to perform the procedures. The present
invention is especially advantageous for the promotion of
20   less invasive and non-invasive medical procedures.

As used herein, the terms ▓medical procedure▓
and ▓medical treatment,▓ and grammatical variations
thereof, are used interchangeably to refer to surgical
and non-surgical procedures, treatments, therapies,
25   tests, regimens and the like. The term ▓less invasive,▓
as used herein, is reference to procedures which can be
labeled less invasive, minimally invasive and not or non-
invasive.

A system aspect of the present invention
30   includes a computer message server that includes a
stored, predefined message pertaining to selected medical
conditions, information on alternate therapies, including
the device-dependent medical or surgical procedure and a
stored provider directory containing contact information
35   for a plurality of medical service providers qualified to

perform the device-dependent medical procedure. The
message server is Internet-linked and equipped with
display-generating Hypertext Markup Language (HTML)
files. An access route to the user interface linkage is
5   advertised publicly together with an ad message about the
medical condition and alternate therapies.

The computerized system receives from the user
via the Internet a user location identifier such as a ZIP
code or telephone area code. Implemented with database
10   application software, the provider directory can be
queried with the user ZIP or area code. Displayed to the
user over the Internet, the query result includes
information on alternate therapies for the medical
condition, including the less invasive or non-invasive
15   procedure, and contact information for the nearest
qualified service providers.

Referring now to FIGURE 1 for a more detailed
description, the elements of a Internet-based provider
directory server system 10 are shown. System 10 is
20   preferably implemented on a general purpose computer 11
with sufficient hardware and software resources to act as
an Internet World Wide Web server. The phrase "general
purpose computer," as used herein, is a reference to
commercially standard computers which are designed for
25   multiple applications as opposed to CPU-based electronics
customized for a specific application such as device
control. Examples include the well-known group of
computers conventionally labeled IBM-compatible personal
computers, or more simply PCs. PCs are based on complex
30   instruction set (CISC) CPUs from Intel Corporation
(INTEL), Advanced Micro Devices, Inc. (AMD), VIA
Technologies, Inc. and others. The related, evolving CPU
product line from INTEL includes CPU chipsets available
under designations such as "80486®," "Pentium®,"
35   "Pentium® II," "Pentium® III." An exemplary CPU product

line for general purpose computers by AMD is available
under the designation "AMD-K6®." VIA Technologies, Inc.
CPUs for general purpose computers are sold under the
designation "Cyrix®."

5   General purpose computers based on reduced
instruction set (RISC) CPUs are also well known.
Examples include computers based on the Alpha® chipset
available from the Compaq Computer Corporation.

          Also suitable are the computers commercially
10   available from Silicon Graphics, Inc. (Mountain View, CA)
under the designation "Origin 200."

          Computer 11 preferably operates with a general
purpose networkable operating system. The phrase
"general purpose networkable operating system" is a
15   reference to commercially standard operating systems such
as those available from the Microsoft Corp. under
designations such as Windows® NT and Windows 2000®.
Other examples of general purpose operating systems
include Macintosh® (Apple Computers, Inc.), UNIX (various
20   resellers) and Open VMS® (Compaq Computer Corporation).

          System 10, which could also be labeled a
computer message server, is operably linked by a
combination hardware-software connection (or linkage) 12
to a wide access communication network in the form of the
25   Internet 14. The Internet 14 includes a plurality of on-
line service providers 16 from which individual users
gain access via computer terminals 18 from homes,
offices, wireless telephones and libraries, etc.

          While the Internet is preferred as the most
30   widely available data access network, the present
invention necessarily applies to a variety of wide access
data networks. Suitable data networks include the
subscription network services such AOL® from America
Online, Inc. (Dulles, VA) and CompuServe® from Compuserve
35   Interactive Services, Inc. (Columbus, OH), company

intranets, and national data network utilities such as France's Minitel.

Installed for running on the general purpose computer 11 are a network application HTTP layer module 20, HTML operator display files 22, and a database application module 24. The term "module," as used herein is a reference to a software element such as a program, subprogram, software process, subroutine, or grouping of code segments and the like. The software modules of system 10 are preferably discrete executable programs which run as discrete processes. Unless otherwise indicated, the software modules and code segments are configured to share access to a variety of software variables and constants as needed through subroutine calls, common shared memory space, and the like.

HTTP layer 20 represents the software necessary for Internet communication protocols such as the low level TCP/IP and the application level World Wide Web ("the Web"/HTTP/HTML). HTML files 22 represent the hierarchy of stored HTML files for creating user displays which appear on an Internet user's computer when accessing the provider directory system 10. While HTML is preferred, the provider directory system 10 could also be implemented using VRML or any other suitable language which allows for user display creation over the World Wide Web layer of the Internet.

The stored HTML files 22 include displays with predefined messages about the medical procedure targeted for promotion. Also preferably stored among the HTML files 22 are displays describing the medical condition which the medical device is designed to treat or diagnose. Table I, below, includes a list of HTML displays for exchanging information with a user over the Internet.

TABLE I

HTML User Interface Display Files

Introductory Display With Messages and Switches Enabling a User to Obtain Information Concerning a Selected Medical Condition, Including a Switch for Requesting Additional Information
Display With Message Containing Information About Conventional Medical or Surgical Procedures and the Less Invasive or Non-Invasive Medical Procedure for the Identified Medical Condition
Display Requesting User ZIP or Telephone Area Code
Display Requesting Reentry of ZIP or Area Code
Display Requesting User's Insurance Company and Health Plan
Display Enabling User to Request a List of Qualified Providers in His/Her Locality
Display for Presenting a List of Qualified Medical Service Providers With Links on Each Medical Provider for Gaining Further Detail
Display for Presenting Complete Contact Information for a Selected Provider
Display Presenting Disclaimer and Warning
Display for Requesting an Appointment With a Selected Provider

A suitable software program for development and maintenance of user-accessible Internet Web-site files and hierarchy is available from 4D, Inc. (San Jose, CA) under the designation "4D Version 6.0."

General purpose computer 11 is also setup to run a general-purpose database application module 24 that has been customized and configured to provide aspects of the provider referral service. Database application 24 includes a search engine module 26 for querying data

files and a medical provider directory 28, a ZIP code coordinate map 30 and an optional but preferred telephone number coordinate map 32.

A variety of database development programs with query functions are available for creating and maintaining the data directories. These include Oracle, Sybase SQL, Powersoft, and Microsoft Access, with Oracle being preferred.

Medical provider directory database 28 is populated with contact information for medical service providers who have access to necessary equipment and are qualified to perform the procedure to be promoted. Table II, below, describes the field configuration for records in the provider directory 28.

TABLE II

Medical Provider Data Directory Record

Field Designation	Data Format
PROVIDER NAME	TEXT
PROVIDER TYPE (HOSPITAL, MED. CENTER, GROUP PRACTICE, INDIV. PHYSICIAN)	ENUMERATION
AFFILIATES (PHYSICIANS OR FACILITIES)	TEXT (MULTI)
SUBSCRIPTION CLASS (SUBSCRIBER, QUALIFIED AFFILIATE, QUALIFIED)	ENUMERATION
STREET 1	TEXT
STREET 2	TEXT
CITY	TEXT
STATE	TEXT
ZIP CODE	INTEGER
LATITUDE COORDINATE	FLOATING POINT
LONGITUDE COORDINATE	FLOATING POINT

HEALTH PLANS ACCEPTED	TEXT (MULTI)
TELEPHONE	TEXT
E-MAIL ADDRESS	TEXT
FACSIMILE	TEXT

5   The PROVIDER TYPE field allows provider system
10 to separately track individual physicians, physician
groups, outpatient surgery centers, hospitals and medical
centers. The AFFILIATES field allows system 10 to relate
10   individual physicians to physician groups, outpatient
surgery centers, hospitals and medical centers. Together
the PROVIDER TYPE and AFFILIATES field allows system 10
to provide users with lists of individual physicians
associated with a qualified physician group, outpatient
15   surgery center, hospital or medical center.
          Data about a provider's relationship to the
referral service is recorded in the SUBSCRIPTION CLASS
field. In the preferred approach to the present
invention, individual physicians, physician groups,
20   outpatient surgery centers, hospitals and medical centers
may subscribe to the promotion service. The SUBSCRIPTION
CLASS field allows system 10 to make patient referrals
for any medical service provider qualified to perform the
procedure to be promoted, but to give subscribing
25   providers preferential treatment such as preferential
listing in a given area. Therefore, the SUBSCRIPTION
CLASS field also allows for an evolution of the promotion
service. In the early stages of a promotion effort, the
promotion goal is best served by having as many qualified
30   providers as possible making system 10 worthwhile for
users. In later stages, when a large group of providers
is established, the promotion service can more
effectively require that providers subscribe and pay fees
in order to be given a preferential listing position.

In addition to address, telephone and e-mail address fields, the records of provider directory 28 include fields for LATITUDE COORDINATE and LONGITUDE COORDINATE. The latitude and longitude data allows for

5   more efficient proximity-based comparisons.

As noted above, the Internet based display screens call for a user of system 10 to enter a ZIP Code or telephone area code number. The databases designated ZIP code coordinate map 30 and telephone number

10   coordinate map 32 relate latitude and longitude coordinates to postal ZIP codes or telephone area code numbers, respectively. The combination of the LATITUDE COORDINATE and LONGITUDE COORDINATE fields of provider directory 28 and the ZIP code map 30 or area code number

15   map 32 allow efficient proximity calculations and querying.

Such coordinate mapping data files are commercially available and include latitude and longitude data associated with ZIP codes and telephone area codes

20   (NPA) and central office code (NNX). While on-server coordinate map databases are preferred for reliability and speed, such data can be obtained over the Internet as needed from specialized subscription services, such as data provided by Switchboard, Inc. (Westboro, Mass.).

25   The HEALTH PLAN ACCEPTED field tracks the health plans accepted by the provider and allows system 10 to list medical service providers according to whether a user's health plan is accepted.

System 10 also includes referral billing log 34

30   and associated code segments for recording each user access and provider referral. As contemplated, the promotional service is funded by charging either a percentage of the equipment sales price, a fixed per case fee or a periodic subscription fee to the related

35   equipment manufacturer and a fixed or periodic

subscription fee to the listed medical service providers
qualified to perform the target procedure. According to
a preferred approach to the present invention, equipment
manufacturers are charged a fee based on the sales price

5 of the equipment and supplies used in the target
procedure, and listed medical service providers are
charged a monthly fee based on a mark-up over the cost of
the advertising and/or the number of users asking to be
referred to their offices. Referral tracking and logging

10 provides a data set valuable for marketing the promotion
and referral service. Table III, below, is a list of the
data field formats for the referral billing log record.

TABLE III

Referral Billing Log Record

Field Designation	Data Format
PROVIDER REFERRED	TEXT
REFERRAL DATE	DATE
REFERRAL TIME	TEXT
REFERRAL PLACEMENT	INTEGER
FULL CONTACT VIEWED	BINARY
USER LOCATION IDENTIFIER	INTEGER

The REFERRAL PLACEMENT field allows system 10 to log
whether the provider was placed at the start of a list

25 viewed by the user. Likewise, the FULL CONTACT VIEWED
field allows system 10 to log whether a user chose to
view complete contact data for the identified provider.

Flowchart FIGURE 2 presents a method embodiment
of the present invention for promoting the utilization of

30 a selected medical or surgical procedure. At box 37, a
user accesses an advertised website, such as
www.123emed.com. HTML files resident on a server system
such as system 10 are loaded on the user's computer to

generate a display. First, an introductory display presents a list of medical conditions for which a non- or less invasive procedure is being promoted (box 38). At box 39, system 10 checks if the medical condition Angina

5   has been selected. Box 40 represents the steps of checking for a user's selection of other medical conditions with corresponding HTML displays.

If the user has clicked on (or otherwise selected) "angina" from the listing to learn information

10 about therapy options for angina, a display is provided with information about angina and related therapies, new and conventional (box 41). Next, the user is offered an option to continue and receive more information (box 42). Box 44 represents the step of checking on the user's

15 decision whether or not to get additional information.

Box 46 represents the user's decision not to proceed. If the user decides to proceed, system 10 presents a display allowing the user to request a list of qualified providers in his locality by inputting a user

20 location identifier, such as a ZIP code or telephone area code (box 48). The ZIP code (or other location) data is checked for valid format (box 50). At box 52, system 10 obtains user location coordinates, for example, based on the user ZIP code from ZIP code coordinate map 30.

25   Information about this user inquiry is stored for billing purposes (box 54).

The user is then asked to enter his/her insurance company and health plan or select from a list of carriers and their health plan (PPO, HMO, indemnity,

30 etc.)(box 56). For example, system 10 presents the user with a menu display for selecting from a plurality of health insurance plans (.e.g., insurance companies, HMOs, Medicare, Medicare supplement plans, etc.).

Box 58 confirms if a health plan was selected

35 by the user. If the user fails to select a health plan,

the display ends (box 59). For users having entered or selected valid health insurance information (box 58), system 10 searches provider data directory 28 based on the user location coordinates to obtain a list of

5   qualified providers within a predetermined distance, e.g. up to 100 miles, from the user (box 60). The preferred predetermined distance necessarily varies according to the medical procedure being promoted. A user display with a menu for selecting a proximity limit is also

10   contemplated.

          The obtained list of providers may be queried and arranged in an order giving preference to providers accepting the user's health insurance plan as indicated at box 62. Next, the Internet-enabled user is presented

15   with a display listing qualified providers (box 64). At box 66 is represented the step of recording this referral in referral billing log 34.

          Also contemplated is a feature which allows users to select a specific service provider from the

20   listing of qualified providers, and request from that specific provider, an appointment. Appointment times are preferably set on-line by using a provider appointment schedule maintained by system 10. Alternatively, the appointment request may be electronically forwarded (e.g.

25   e-mail, facsimile) to the service provider with user contact information thereby allowing a representative of the provider to directly contact the interested user. Alternatively, the selected provider's telephone number can be displayed.

30   While an Internet-based embodiment of the present invention offers advantages in flexibility for presenting information to a user, a telephone network-based embodiment is advantageous in that the public telephone network has an even wider distribution among

35   consumers. Moreover, users unfamiliar with using a

computer terminal are generally comfortable using
telephone messaging systems.

Accordingly, the present invention includes a
system and method for promoting the utilization of a
5   selected medical procedure via the telephone network.
Referring now to FIGURE 3 for a more detailed
description, the elements of a telephone-based
promotional system 110 are shown. System 110 is
preferably implemented on an interactive voice response
10   unit (IVRU) computer 111. IVRU computer 111 is operably
linked by a conventional trunk connection 112 to a wide
access communication network in the form of the public
telephone network 114. As illustrated, a series of phone
lines 116 from which individual users connect to IVRU
15   computer 111 are provided by a telephone company as a
trunk line 112.

Running on the IVRU computer 111 are a script
execution module 170, a script of audio input/output
digital audio files 122, and a database application
20   module 124. Script execution module 170 oversees the
execution of a script program such as 122, which dictates
the order of playing selected audio files (e.g. 178), the
input requests, and required database queries via
database application 124.

25   Script execution module 170 includes a DTMF
decoder 172 and a text-to-audio voice converter 174.
DTMF decoder 172 is provided to convert telephone touch-
tone entries by the user into computer data. Text-to-
audio voice converter 174 is provided to convert computer
30   based contact information into an audio voice message.
Script execution module 170 optionally but preferably
includes a voice recognition decoder 176 for converting
simple spoken words by the user into computer data.

Angina script 122 includes predefined audio
35   messages about conventional therapies and the less

invasive or non-invasive medical procedure targeted to be promoted. Specifically, system 111 includes at least an angina introduction message 178, an angina data request message 180, and a treatment warning message 182.

5 Additional message files 183 may be stored and played as desired.

IVRU computer 111 includes a general-purpose database application module 124 customized and configured to provide aspects of the provider referral service as

10 described above for Internet-based system 10 and computer 11. Database application 124 includes a search engine module 126 for querying data files, a medical provider directory 128, a ZIP code coordinate map 130 and an optional, but preferred, telephone area code number

15 coordinate map 132.

As discussed above for directory 28, medical provider directory database 128 is populated with contact information for medical service providers who have access to necessary equipment and are qualified to perform the

20 procedure to be promoted. Table I, above, describes the field configuration for records in the provider directory 128. In an alternate embodiment, the records of directory 128 may include both contact data and corresponding digital audio recordings thereby

25 eliminating the need for text-to-audio voice converter 174.

Like system 10, telephone-based promotional system 110 also includes a referral billing log 134 and associated code segments for recording each user access

30 and provider referral. The referral billing log 134 allows for a variety of subscriber billing options.

Telephone-based promotional system 110 is preferably composed of hardware and software components specially created for the telephone messaging

35 application. Such system components are commercially

available from AT&T, Inc. under the designation "AT&T
6486/6386 StarStation" and "VRU AT&T Voice Power IV
(VP4)." Less costly systems can be created by equipping
a general purpose computer with hardware peripherals and
5   a related interface for system connection. For example,
PC-compatible telephony equipment is commercially
available from the Dialogic Corporation (Parsipanny, NJ)
under the commercial designation "SingleSpan™ Series."

Flowchart FIGURE 4 describes a method
10   embodiment of the present invention for promoting the
utilization of a selected less invasive or non-invasive
medical or surgical procedure over a telephone network.
At box 230, a telephone user dials an advertised toll-
free number such as 1-800-NNN-NNNN to learn information
15   about therapy options for the advertised medical
conditions. Telephone message server 110 answers the
call and a medical condition menu message is played (box
232) which enables users to select from a list of
advertised conditions by pressing a telephone keypad
20   button. Box 234 represents the step of system 110
checking and waiting for a telephone keypad entry.

While flowchart FIGURE 4 calls for touch-tone
phone entries, a system and method according to the
present invention may also rely on conventional voice
25   recognition or combinations of voice recognition and
touch-tone entries.

If the user presses keypad button "1" for
angina (box 236), system 110 triggers script execution
module 170 to run angina input/output script 122 and an
30   introductory message 178 is played to the caller with
information about angina and related therapies, new and
conventional (box 240). Flowchart box 238 represents the
steps of checking for and processing a user's selection
of a different medical condition, such as lower back
35   pain.

After the introductory message, the user is offered an option to continue and receive more information (box 240). If the user requests more information (box 244) by touching a phone key as detected by DTMF decoder 172, an audio message introducing ECP is played as represented by flow chart box 246.

At box 248, a message 180 is played asking the user if he wants to hear about qualified providers in his locality by entering a user location identifier such as a ZIP or telephone area code. As dictated by script program 122, user entries are checked for valid ZIP or area code format (box 250). An invalid format triggers a reentry message as represented by box 251. After a valid ZIP or area code has been entered, system 110 plays a warning message 182 (box 252).

In the process step represented by box 254, system 110 uses database application 124 to obtain user location coordinates based on the user ZIP or area code from ZIP or area code coordinate map 130. Given user coordinates, provider data directory 128 is searched based on the user location coordinates to obtain a list of a predetermined maximum number of qualified providers within a predetermined distance, e.g. up to 50 miles, from the user (box 256). A list of up to five providers is preferred.

The communication of results to the user then proceeds one-provider at a time with user prompting. At box 258, a message introducing a provider is played. Box 260 represents the on-demand conversion from text to audio of a providers contact information using converter module 174. The provider contact information played to the user preferably includes the name, phone number and street address.

For each playing of contact information to a user, a provider referral record is stored for billing

purposes (box 262). The telephone user is offered the option of repeating contact information for the last provider (box 264) or moving on to the next nearest provider as represented by boxes 265, 267, 269 and 270.

5   More specifically, the step of checking for a phone keypad entry within a predetermined amount of time is represented by box 265. If no entry is made after a predetermined amount of time passes, system 110 proceeds to box 269 to check if information on another provider

10   can be played to the user. At box 267, system 110 checks for a phone keypad entry of "1," indicating the user's choice to repeat provider information. If a phone keypad entry of "1" is detected, the process flow returns to box 260 and the provider information is repeated. If a phone

15   keypad entry other than "1," e.g. "2," is detected, system 110 proceeds to box 269.

Box 269 represents the process step of checking if contact information has been played for all the identified qualified providers. If there are more

20   qualified providers to list to the user, system 110 increments a counter variable (box 270) and plays contact information for the next provider to the user.

When system 110 has played contact information for the last provider, the user may be offered a

25   telephone connection to a provider, selected by the user by touching a key, for an additional charge (billed to the user's telephone). If no specific provider is selected, a courtesy message is played before disconnecting the telephone user (box 272).

30   In an alternate embodiment of the present invention, telephone-based promotional system 110 is equipped with a software module for automatically detecting a caller's phone number using the Automated Number Identification (ANI) system, a service available

35   from the phone company providing a toll-free number. By

retrieving the user's phone number automatically upon dialing, the step of requesting a user location identifier such as a ZIP code or phone number can be eliminated.

With regard to a telephone network-based approach to the present invention, the use of live human telephone operators equipped with computer terminals linked to system 10 (FIGURE 1) is also contemplated. According to this live operator approach to the present invention, users would place a telephone call and reach a live telephone operator. The telephone operator would read to the user the display messages generated by system 10, including warning messages (i.e. a script), and input to system 10 data received verbally from the user. The resulting list of service providers is also read by a live operator to the user via telephone.

The method aspects of the present invention include the step of publicly advertising the information service. FIGURE 5 is an advertisement message 300 for attracting users interested in a treatment for angina, directing them to an Internet World Wide Web site 302 (www.123emed.com) or a toll free number 304. A variety of print media, poster, radio, television and Internet advertising are contemplated for directing consumers to Internet and/or phone message provider directories equipped as described above.

FIGURE 6 is a screen print of an introductory advertisement page 400 for attracting users interested in a treatment for back pain. Introductory page 400 directs users for information on treatment options to the 123emed Web site 402 or 123emed's toll free telephone number 404.

As seen in FIGURE 7, when a user accesses the 123emed.com website page 500, the user is offered the opportunity to select by HTML link buttons for information on treatment options for one of a variety of

selected medical conditions, such as angina 502 or back pain 504.

The present invention is especially suited for the commercial promotion of less invasive and non-

5   invasive medical and surgical procedures and related medical equipment sales as illustrated in flowchart 601 of FIGURE 8. Flowchart boxes 611 and 613 represent the step of advertising minimally invasive therapies generally and by specific media to consumers (i.e. users)

10 together with contact information for reaching internet server system 10 (FIGURE 1) and/or telephone system 110 (FIGURE 3).

In response to the advertising, a user accesses 123emed.com as represented by box 615. At 123emed.com,

15 the user selects (or enters) the medical condition of interest and then enters zip code and health insurance coverage information (box 617). Given the user's information, system 10 displays to the user information regarding the condition of interest and standard

20 therapies for this condition (box 619).

Box 621 represents the computerized step of determining whether a less or non- invasive therapy exists for the user identified medical condition. If a less or non- invasive procedure is available, system 10

25 preferably first identifies a procedure-qualified provider facility in the form of an office for a physician group, an individual physician's office, a clinic, an outpatient surgery center, a hospital or a medical center (box 623). System 10 then also selects a

30 list of physicians affiliated with the selected provider facility (box 625).

Flowchart box 627 represents the step of displaying to the user via the Internet website display pages information to the user about a less invasive

35 therapy for the condition of interest. Following the

display of background information on the less invasive
procedure, system 10 displays information regarding
provider facilities and physicians qualified to perform
the less invasive procedure which are nearby the user

5   (box 629). As box 629 indicates, the user's health plan
may control which providers are displayed.

System 10 allows the user to view additional
information (box 631) and to choose to select a less or
non- invasive therapy (box 633). Next, the user selects

10   one of the physicians (or providers) as represented by
flowchart box 635. Triggered by the user's selection,
system 10 then displays the target physician and/or
provider contact information (box 637). Also represented
by box 637 is system 10's presentation of a fill-in-the-

15   blanks Internet based form for requesting an appointment
with the selected physician.

After viewing additional information on the
provider (box 639), using the appointment request form
(box 637), the user has the option (box 641) to request

20   an appointment (box 643) and becomes a patient (box 645),
or the user may return to the zip code entry step (box
617).

Numerous variations and modifications of the
embodiments described above may be effected without

25   departing from the spirit and scope of the novel features
of the invention. It is to be understood that no
limitations with respect to the specific methods or
systems illustrated herein are intended or should be
inferred. It is, of course, intended to cover by the

30   appended claims all such modifications as fall within the
scope of the claims.